



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A01N 65/00	A1	(11) International Publication Number: WO 99/18802 (43) International Publication Date: 22 April 1999 (22.04.99)
(21) International Application Number: PCT/GB98/03039 (22) International Filing Date: 9 October 1998 (09.10.98) (30) Priority Data: 9721466.2 9 October 1997 (09.10.97) GB (71) Applicant (for all designated States except US): BARRIER HYGIENE LIMITED [GB/GB]; 36 Haverscroft Industrial Estate, New Road, Attleborough, Norfolk NR17 1YE (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): RYAN, Robert, Eugene [GB/GB]; Honister, North End, Snetterton, Norfolk NR16 2LE (GB). MORRIS, Sandra [GB/GB]; Honister, North End, Snetterton, Norfolk NR16 2LE (GB). (74) Agent: BALDOCK, Sharon, Claire; Boulton Wade Tennant, 27 Fumival Street, London EC4A 1PQ (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: A PESTICIDAL COMPOSITION (57) Abstract There is disclosed a pesticidal composition comprising by volume, approximately 40 to 60 % eucalyptus oil, 10 to 30 % cajaput oil, 10 to 30 % lemongrass oils and 4 to 20 % of surfactant. The composition is used in a method for controlling pesticidal activity at a locus which comprises applying an effective amount of the composition thereto.		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon	KR	Republic of Korea	PL	Poland		
CN	China	KZ	Kazakstan	PT	Portugal		
CU	Cuba	LC	Saint Lucia	RO	Romania		
CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		

- 1 -

A PESTICIDAL COMPOSITION

The present invention is concerned with a
pesticidal composition, and in particular with a
5 pesticidal composition which may be used as an
insecticide and/or a larvicide against, for example,
ectoparasites, a major component of said composition
comprising natural or essential oils.

— Insects and their larvae are common pests of
10 households, animals, crops, meat and poultry houses
and the like. Typically, to eradicate such insect
pests synthetically produced chemical pesticides are
used. These compounds are generally highly toxic to
mammals and plants and are often very slow to degrade
15 making them unsuitable for wide spread application.

Examples of compounds which have previously been
used for eradicating insects and their larvae include
organophosphates which, although generally not as
toxic as synthetic non-organophosphates, still exhibit
20 relatively high toxicity levels. They are, however,
of limited use against some pests. For example, the
larvae of the poultry house beetle are notoriously
difficult to kill and are relatively unaffected by
such organophosphates.

25 Essential oils have been used previously for use
as pesticides. US 4,587,123 discloses that eucalyptus
oil is applied as a pesticide in a composition which
includes a low molecular weight carbon content alcohol
miscible with water. GB 1467 419 also discloses the
30 use of eucalyptus oil as an insecticide in admixture
with an extract of pepper. The compositions disclosed
in these documents generally do not possess broad
spectrum insecticidal or larvicidal activity.

Accordingly, it is an object of the present
35 invention to provide a pesticidal composition which

- 2 -

has broad spectrum activity and which is relatively non-toxic to mammals, particularly humans, or plants.

Therefore, there is provided by the present invention a pesticidal composition comprising by
5 volume approximately 40 to 60% eucalyptus oil, 10 to 30% cajeput oil, 10 to 30% lemongrass oils and 4 to 20% of a surfactant. Preferably, the composition is further diluted with water, in which case the composition preferably comprises approximately 20 to
10 30% eucalyptus oil, 5 to 15% cajeput oil, 5 to 15% lemongrass oils, 40 to 60% water, and from 2% to 10% of a surfactant.

The inventors have surprisingly found that the composition according to the invention has a broad
15 spectrum of activity and is particularly effective against insects having a cuticle or proteinaceous exoskeleton or the like. The presence of the surfactant is believed to confer the broad spectrum pesticidal activity on the composition. The
20 surfactant functions as a penetrating agent which facilitates or aids penetration of the natural oils through the exoskeleton thus permitting the oils to exert their insecticidal activity on the internal organs and/or central nervous system of the insect or
25 larva. Furthermore, the composition according to the present invention, comprises natural or essential oils as a major component and is therefore particularly advantageous in terms of its relative non-toxicity.

The composition is, advantageously, particularly
30 active against poultry house beetle and its larvae. Poultry house beetle is a pernicious pest that is not readily destroyed by insecticidal agents even synthetic pesticides.

Preferably the composition comprises
35 approximately, 25% eucalyptus oil, 10% cajeput oil,

- 3 -

10% lemongrass oils, 5% anionic surfactant and 50% water, which percentage values may deviate by plus or minus 10% for the respective ingredient.

5 As is known, oil of eucalyptus is obtained from various species of eucalyptus and the resulting oils do not possess a uniform analysis. It is believed, however, that the properties of the eucalyptus oil according to the invention are not dependent on a particular source of oil of eucalyptus and one may use
10 oil derived from *Eucalyptus globulous* and *Eucalyptus dives*. Eucalyptus oil is rich in cineole and desirably eucalyptus oil according to the invention comprises cineole and preferably 1-8 cineole in an amount of from approximately 35 to 90% by volume.

15 Preferably, the surfactant may be an anionic surfactant and which may be selected from any one of the following; alkylarylsulfonates, alkanesulfonates, alcohol and alcohol ether sulfates, polyether carboxylates, olefinsulfonates, α -sulfomonomocarboxylic
20 esters and phosphorous - containing anionic surfactants such as phosphoric acid, phosphorous acid, phosphonic acid and phosphinic acid derivatives. Preferably, the surfactant comprises sodium-2-ethylhexyl sulfosuccinate, and preferably in an amount
25 greater than approximately 50%, optionally together with ethanol in an amount from approximately 10 to 25% by volume.

The composition according to the invention, may advantageously, be provided in the form of an oil
30 based solution which provides for better foaming and gripping onto surfaces. Alternatively, the composition according to the invention may be formulated for spray application or as an aerosol. Alternatively the composition may be provided as a
35 powder suitable for sprinkling or as a gel. In

- 4 -

another embodiment of the invention, the composition may further include an appropriate attractant, such as a pheromone or the like, so as to attract the insect to the pesticidal composition.

5 If desired, the composition according to the invention may contain, or be applied in association with other insecticides or pesticides.

10 In another aspect of the present invention there is provided a method for controlling pesticidal activity at a locus, which method comprises applying thereto an effective amount of a composition according to the invention.

15 The present invention may be more clearly understood with reference to the following exemplary embodiment of the invention, which is given by way of example only.

20 Eucalyptus oil, cajeput oil, lemongrass oils, surfactant and water were suitably mixed in the percentage values of 25%, 10%, 10%, 5% and 50% by volume respectively, and subsequently diluted to 1 part per 50 parts water. The prepared solution was either sprayed directly onto the area of application or is provided in the form of a gel, or as a powder for sprinkling.

25 In the present example, the composition according to the invention was applied to mealworm, locusts (*locusta migratoria*), the West Indian cockroach and to poultry house litter beetle (*Alphitobius Diaperinus*).

30 In all cases as can be seen from Table 1 application of the composition resulted in death of the insect within a time period of between 1 to 10 minutes following its application. The insects generally exhibited nervous twitching prior to death
35 indicating an effect on its central nervous system.

- 5 -

Omission of the surfactant from the composition resulted in markedly reduced insecticidal effects. Other variations in the composition, such as omission of one of the oils also resulted in reduced insecticidal activity. The composition was highly successful in exterminating poultry house beetle and its larvae which are notoriously difficult to destroy.

5

- 6 -

TABLE 1 Barrier B Composition

Barrier B = 25% Eucalyptol, 10% Cajaputol, 10%
Lemongrass oils, 5% Surfactant, 50% Water

5

10

Organism	No. Destroyed	Time Elapsed
Mealworm	All	3 Minutes
Cockroach	All	4 Minutes
Locust	All	5 Minutes
Poultry House Beetle	All	1½ Minutes
Larvae of Poultry House Beetle	All	1½ Minutes

- 7 -

Claims

1. A pesticidal composition comprising by
volume approximately 40 to 60% eucalyptus oil, 10 to
5 30% cajeput oil, 10 to 30% lemongrass oils and from 4%
to 20% surfactant.

2. A pesticidal composition according to claim
1 comprising, by volume, approximately 20 to 30%
10 eucalyptus oil, 5 to 15% cajeput oil, 5 to 15%
lemongrass oils, 2 to 10% surfactant and 40 to 60%
water.

3. A composition according to claim 1 or 2
15 which composition comprises by volume approximately
25% eucalyptus oil, 10% cajeput oil, 10% lemongrass
oils, 5% surfactant and 50% water, or a deviation of
between + or - 10% in the quantity of each of the
respective ingredients.

20

4. A composition according to any of claims 1
to 3 wherein said composition is further diluted to 1
part composition per 50 parts water.

25

5. A composition according to any of claims 1
to 4 wherein said surfactant is an anionic surfactant.

30

6. A composition according to claim 5 wherein
said anionic surfactant is selected from the group
consisting of alkylarylsulphonates, alkanesulfonates,
alcohol and alcohol ether sulfates, polyether
carboxylates, olefinsulfonates, α -sulfomonocarboxylic
esters and phosphorous containing anionic surfactants.

35

7. A composition according to claim 6 wherein

- 8 -

said surfactant comprises sodium-2-ethylhexyl
sulfosuccinate

5 8. A composition according to claim 1 which
composition is provided in the form of an oil based
solution, a water based solution, a powder or a gel.

10 9. A composition according to any of claims 1
to 8 which further comprises a suitable insect
attractant.

10 10. A composition according to claim 9 wherein
said attractant is a pheromone.

15 11. A composition according to any of claims 1
to 10 for use against insects having a cuticle or
proteinaceous exoskeleton or their larvae.

20 12. A composition according to any of claims 1
to 11 for use against poultry house beetle or its
larvae.

25 13. A process for controlling pesticidal
activity at a locus, which process comprises applying
thereto, an effective amount of a composition
according to any of claims 1 to 10.

INTERNATIONAL SEARCH REPORT

National Application No
PCT/GB 98/03039

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A01N65/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 629 345 A (NATURAL PLANT PROTECTION) 21 December 1994 see page 2, line 1 - page 3, line 23 see page 3, line 43 - line 48 ---	1-13
A	CHEMICAL ABSTRACTS, vol. 105, no. 15, 13 October 1986 Columbus, Ohio, US; abstract no. 129423, AHMED, S. M. ET AL: "Vapor toxicity and repellency of some essential oils to insect pests" XP002089702 see abstract & INDIAN PERFUM. (1986), 30(1), 273-8 CODEN: IPERAS;ISSN: 0019-607X, --- -/--	1-13



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

12 January 1999

Date of mailing of the international search report

22/01/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Fort, M

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 98/03039

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
------------	--	-----------------------

A, P	CH 688 787 A (DIETER LINSING) 31 March 1998 see column 1, line 1 - column 4, line 22 ---	1-13
A	AT 400 395 B (HAERPFER-HORN HERTA MAG) 27 December 1995 ---	
A	WO 96 28033 A (PALMROW PTY) 19 September 1996 -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/03039

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0629345	A	21-12-1994	FR 2706248 A JP 7025706 A	23-12-1994 27-01-1995
CH 688787	A	31-03-1998	NONE	
AT 400395	B	27-12-1995	EP 0737479 A AT 175591 A	16-10-1996 15-05-1996
WO 9628033	A	19-09-1996	AU 4531996 A AU 4871496 A WO 9628032 A	02-10-1996 02-10-1996 19-09-1996

This Page Blank (uspto)